Instruction Manual 2808

Power Supply Type 2808

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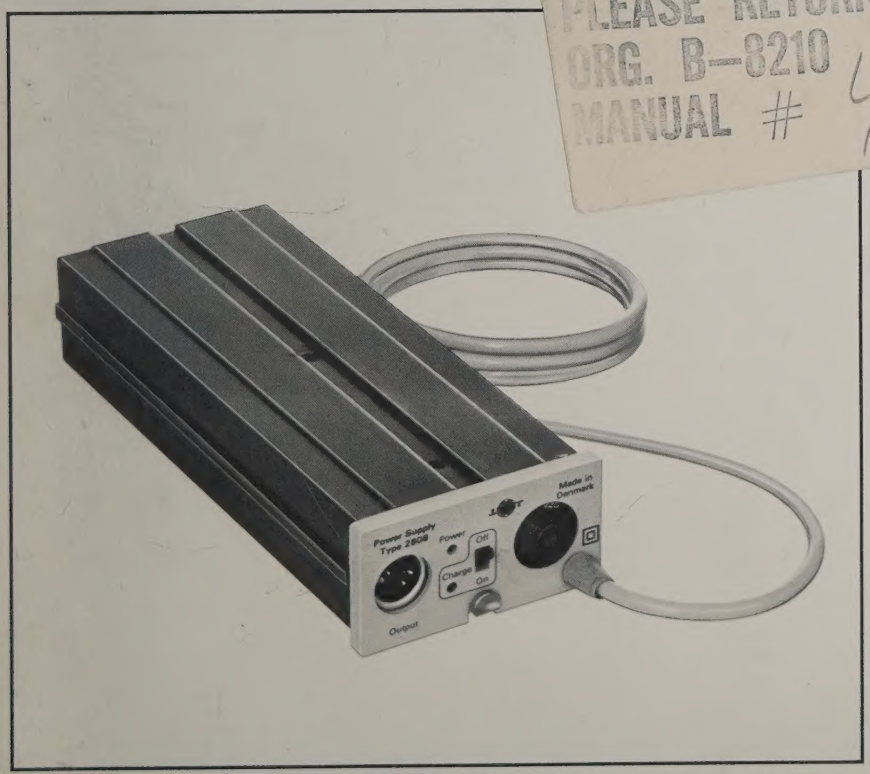
MANUAL # 4



A plug-in supply for mains operation and recharging of portable B & K measuring and recording instruments, such as Level Recorder Type 2306 and Tape Recorders Type 7003 and 7004, which have plug-in battery packs. For recharging spare battery packs outside these instruments or for recharging 1,2 V (size R 20) nickel cadmium cells for use with other instruments, a Charging Adaptor AQ 0157 and Battery Box ZG 0146 are available as accessories for use with the supply.

Brüel & Kjær

POWER SUPPLY
TYPE 2808

(from Serial No. 673155)

August 1977

This apparatus has been designed and tested according to class II of IEC Publication 348, Safety Requirements for Electronic Measuring Apparatus, and has been supplied in safe condition. The present instruction manual contains information and warnings which shall be followed by the user to ensure safe operation and to retain the apparatus in safe condition.

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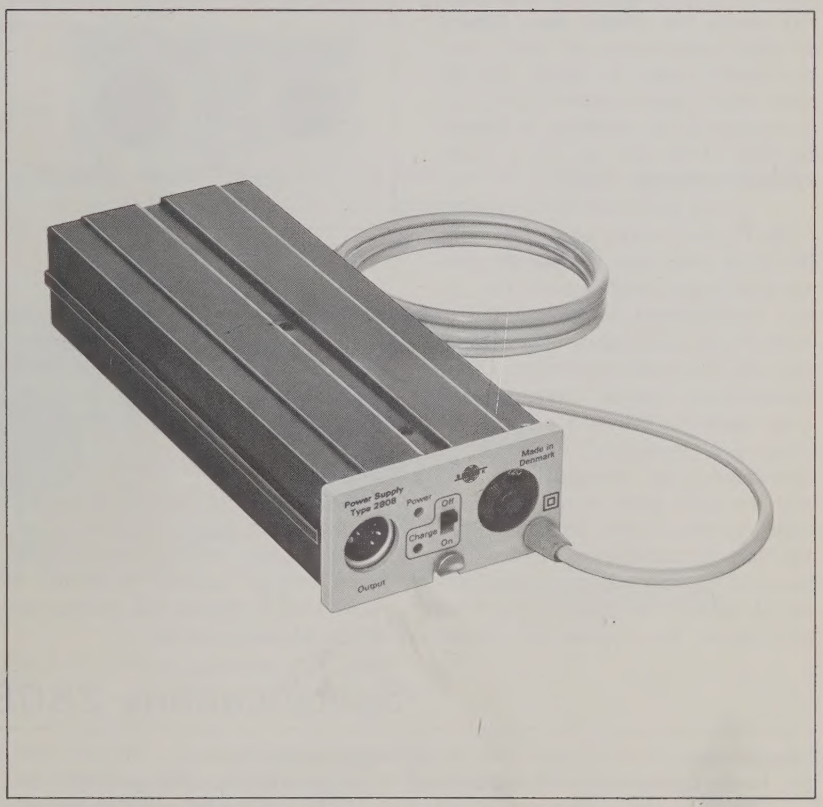
Power Supply

FEATURES:

- Plugs directly into battery compartment of Level Recorder Type 2306, Tape Recorders Types 7003 and 7004 as well as other portable B & K instruments
- Accepts line voltages from 100 V to 240 V (50 to 60 Hz) AC
- Two DC output lines
- Extremely small stray magnetic field
- Excellent immunity from supply line switching transients
- Double insulated. Fulfils safety class II of IEC R 348

USES:

- Mains operation of portable measuring and recording instruments
- Recharging plug-in battery packs
- Recharging 1,2 V (IEC size R 20) nickel cadmium cells



The Power Supply Type 2808 is designed especially for mains operation of portable B & K measuring and recording instruments, such as Level Recorder Type 2306 and Tape Recorders Type 7003 and 7004, which have plug-in battery packs. It plugs directly into the battery compartment of these instruments or may be used externally for powering the instruments whilst at the same time recharging the 1,2 V nickel cadmium cells which may be contained in their battery packs. Moreover, it may also be used for recharging 1,2 V nickel cadmium cells for other portable instruments which normally accept conventional dry cells (IEC size R 20).

The 2808 is a double insulated supply, fulfilling safety class II of IEC R 348. It may be powered from 100 to 240 V (50 to 60 Hz) AC mains lines and has a maximum power consumption of 30 VA. Special attention has been paid to obtaining an extremely low stray magnetic field with the supply and to suppression of mains line switching transients so that these do not influence the operation of portable instruments.

As can be seen from the block diagram shown in Fig.1 the 2808 is provided with two outputs, a 2 pole output on the rear plate and a 7 pin DIN output on the front plate. The rear plate output supplies a 7,5 V (1,25 A) DC for powering portable instruments when the 2808 is plugged into their supply compartment in place of their plug-in battery pack. For powering instruments re-

motely, without removing their battery pack, the front plate output is employed. This connects to the EXT. POWER socket of the instruments and supplies a 7,5 V (1,25 A) DC as well as a 12 V (0,4 A) DC which is used for recharging the 1,2 V nickel cadmium cells contained in the battery packs.

For recharging battery packs separately, outside the supply compartment of instruments, the Charging Adaptor AQ 0157 is available as an accessory. This is shown in Fig.4 and permits exhausted battery packs to be recharged in the laboratory using the 2808, thus freeing portable instruments for field measurements with a spare battery pack fitted. Spare battery packs can be made up by ordering a Battery Box ZG 0146 plus six 1,2 V nickel cadmium cells QB 0008.

The 1,2 V nickel cadmium cells QB 0008 may also be used for powering portable instruments that accept conventional dry cells (IEC size R 20). Their main advantage compared with dry cells is economy. They have a high charge capacity for a long operating life and may be recharged at least 500 times before replacement is necessary. If less than six cells have to be recharged then Dummy Cells ZR 0017 are available as accessories. These may be used to make up the total number of cells in the Battery Box to six and aside from ensuring proper contact between the cells and the Charging Adaptor, they also limit the charging current so that cells are not overcharged. For fully discharged cells recharging takes approximately 14 hours.

Two LEDs (light emmitting diodes) on the front panel indicate when mains power is connected and when charge current is drawn. A slider switch allows the charge voltage to be switched off.

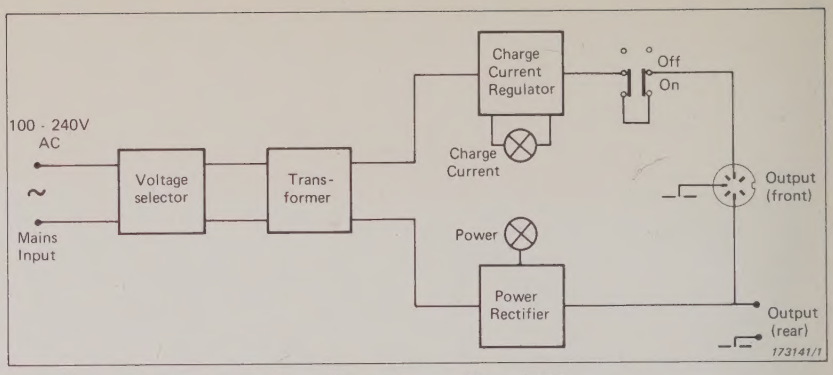


Fig.1. Block diagram of Type 2808

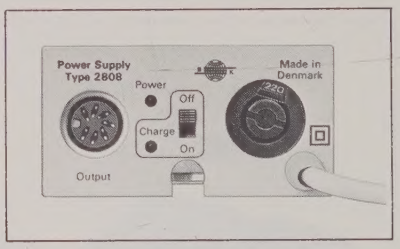


Fig.2. Front panel of Type 2808

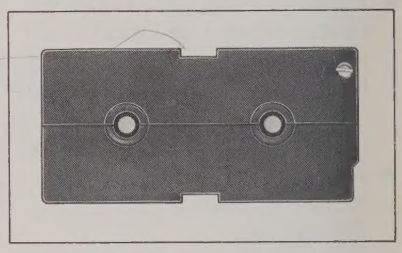


Fig.3. Rear panel of Type 2808

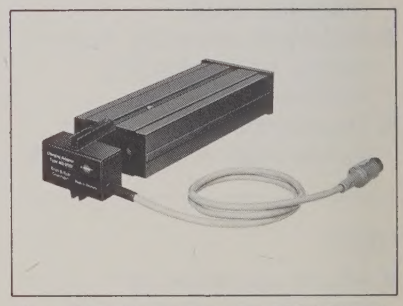


Fig.4. Charging Adaptor AQ 0157 fitted to Battery Box ZG 0146

Specifications 2808

Power Output
- **Loaded Output:** 7,5 V (1,25 A) DC when charging
- 6 V (1,7 A) DC when not charging
- **Open Circuit Output:** 12 V DC
- **Output Ripple:** 1,2 V peak to peak at 1,25 A
- **Output Impedance:** < 2 Ω

Charge Output:
- **Loaded Output:** approx. 12 V (0,4 A) average
- **Open Circuit Output:** approx. 14 V average
- **Recharge Time:** 14 hours maximum depending on charge state of cells QB 0008

Mains Input:
- 100; 115; 127; 220 and 240 V AC ± 10% (50 to 60 Hz) complies with the class II safety requirements of IEC 348

Power Consumption:
- Max. 30 VA (continuous)

Dimensions:
- **Height:** 40 mm (1,5 in)
- **Width:** 76 mm (3 in)
- **Depth:** 190 mm (7,5 in)

Weight:
- 1,1 kg (2,4 lb)

Accessories Included:
- 1 7 pin DIN plug JP 0703
- 3 Slow blow fuses:
- VF 0030 for 220 to 240 V AC lines
- VF 0042 for 100 to 127 V AC lines
- VF 0032 for charge line

Accessories Available:
- Ext. Power Cable AQ 0041 for Types 7003 and 7004
- Ext. Power Cable AQ 0035 for Type 2306 and other instruments
- Charging Adaptor AQ 0157
- Battery Box ZG 0146
- 1,2 V (size R 20) Nickel Cadmium Cells QB 0008
- Dummy Cells ZR 0017

2. CONTROLS AND OPERATION

2.1. GENERAL

In this Manual operation of the 2808 is confined to its use with Charging Adaptor AQ 0157. For information regarding its use as a plug-in supply for mains operation of portable B & K measuring and recording instruments the Instruction Manual for the relevant instrument should be consulted.

2.2. CONTROLS AND CONNECTIONS

The controls of the 2808 are shown in Fig.2.1. Its front panel OUTPUT socket accepts a 7 pin DIN plug (B & K no. JP 0703) and has the pin connections shown in Fig.2.2.

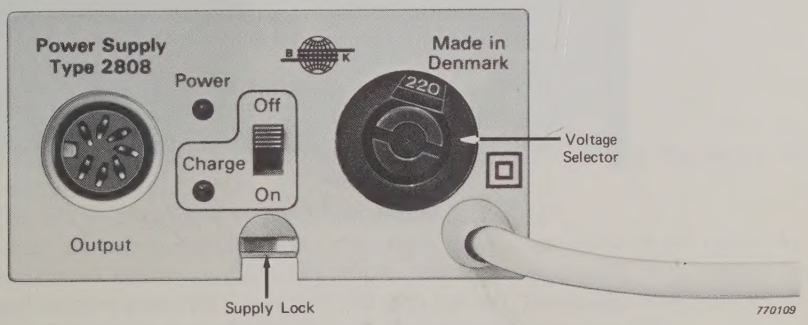


Fig.2.1. Front panel of the 2808

When plugged into the battery compartment of a portable instrument the supply lock on the front panel of the 2808 automatically connects the mains transformer guard of the supply to the chassis of the instrument.

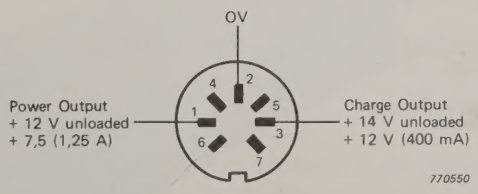


Fig.2.2. External view of OUTPUT socket of 2808

2.3. PRELIMINARY

Before connecting the 2808 to a mains supply the following mains voltage setting and fuse checks should be carried out to ensure safe operation.

2.3.1. Mains Voltage Setting

The 2808 may be powered from a 100, 115, 127, 220 and 240 V AC ± 10% (50 to 60 Hz) mains supplies. The mains voltage setting is displayed in the window of the VOLTAGE SELECTOR on the front panel of the supply. To adjust the selected voltage, insert a coin or wide blade screwdriver into the slots at the centre of the selector and turn it until the correct voltage setting is displayed in the window.

2.3.2. Mains and Charge Line Fuse Checks

The fuse holder containing the mains fuse of the 2808 is shown in Fig.2.3 and is accessible after having removed the black plastic case of the supply which is fastened by three screws on its top panel. Make sure that only fuses of the required rated current and of the specified type are used with the supply. The use of mended fuses or of short circuiting the fuse holders should be avoided.

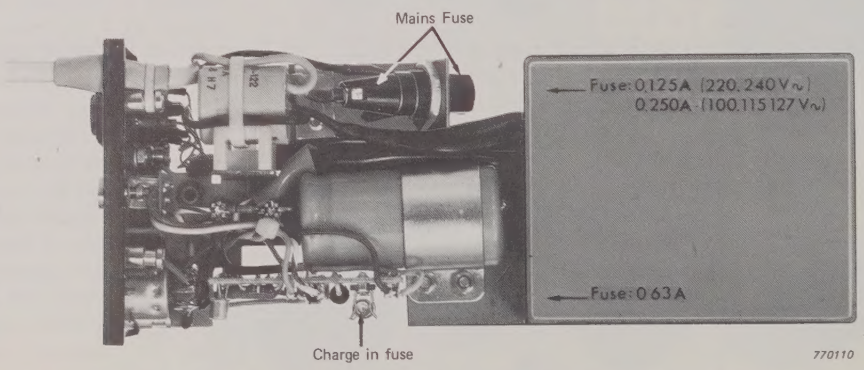


Fig.2.3. Mains and Charge line fuses of the 2808

For operation from 100; 115 and 127 V mains supplies the mains fuse should be a 250 mA slow blow (B & K no. VF 0042), whilst for 220 and 240 V supplies it should be a 125 mA slow blow (B & K no. VF 0030). Both types of fuse are provided with the supply.

Also shown in Fig.2.3 is the fuse holder containing a 630 mA slow blow fuse (B & K no. VF 0032) protecting the charge line of the supply. This need only be replaced if the Charge Current LED on the front panel of the supply fails to light when the CHARGE switch is set to "On" with a plug-in battery pack connected for recharging.

2.4. MAINS OPERATION OF CHARGING ADAPTOR AQ 0157

2.4.1. Recharging Plug-in Battery Packs

The plug-in battery pack used by many of the portable recording and measuring instruments in the B & K range consists of a Battery Box ZG 0146 containing six 1,5 V alkaline cells QB 0004 or six 1,2 V rechargeable nickel cadmium cells QB 0008. When fitted with cells QB 0008 (not QB 0004), the cells may be recharged from a mains supply using the 2808 together with the Charging Adaptor AQ 0157. This is available on separate order and is used in place of the built-in charging circuit of the portable instruments, thus freeing them for field use, whilst discharged cells are recharged in the laboratory using the 2808.

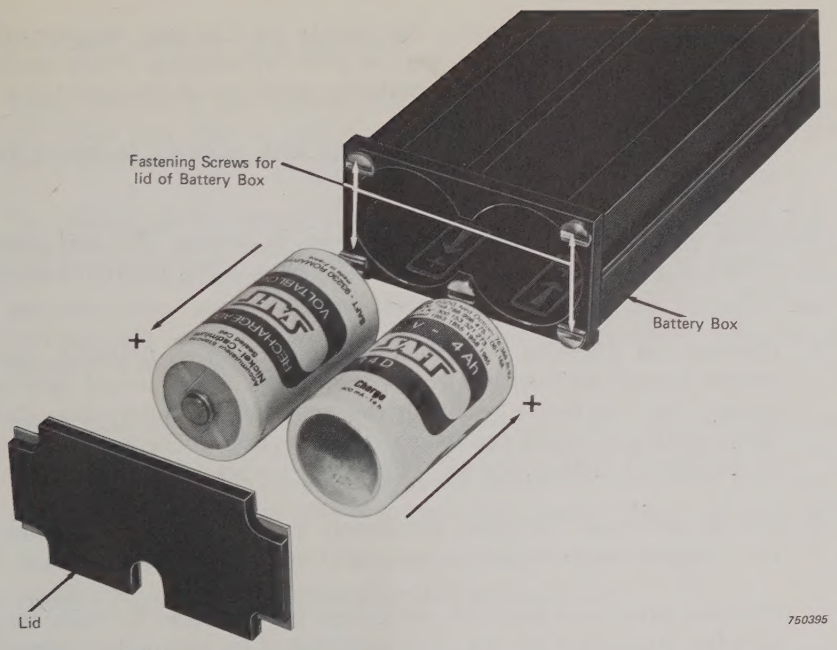


Fig.2.4. Replacement of nickel cadmium cells QB 0008

To recharge a plug-in battery pack proceed as follows:

1. Using a screwdriver release the lid of the Battery Box by turning the screw head fastening indicated in Fig.2.4.

2. If alkaline or conventional dry cells are fitted then these should be replaced by rechargeable nickel cadmium cells QB 0008. When loading cells care should be taken to ensure that the positive pole (stud on cell casing) faces the direction indicated in each of the two compartments of the box. See Fig.2.4.

   EXPLOSION RISK! DO NOT ATTEMPT TO RECHARGE ALKALINE OR CONVENTIONAL DRY CELLS AND AVOID FITTING RECHARGEABLE CELLS FITTED WITH THEIR POLES REVERSED.

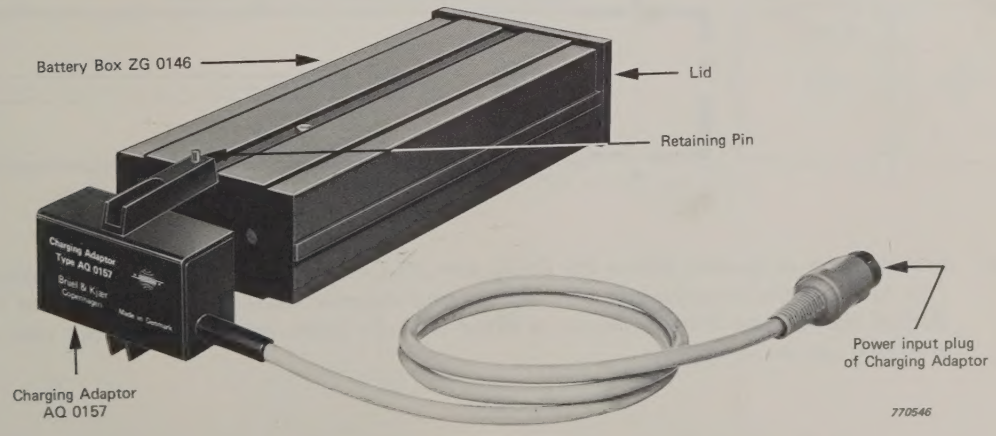


Fig.2.5. Connection of Battery Box ZG 0146 with Charging Adaptor AQ 0157

3. Replace the lid of the Battery Box and fit the Charging Adaptor AQ 0157 as shown in Fig.2.5. The Adaptor is locked in place by pressing it fully against the end of the box and pressing the spring loaded pins on its top and bottom forks.

   Earlier types of battery box not provided with holes for fastening the Charging Adaptor, may be modified as shown in Fig.2.6.

4. Carry out the preliminary checks given in section 2.3 and connect the OUTPUT socket of the 2808 with the 7 pin DIN plug of the Charging Adaptor's power input line.

5. Connect the 2808 to the mains supply and set its CHARGE switch to "On". The charge current LED on the front panel of the 2808 should light indicating that the supply has started to recharge the cells in the Battery Box. For fully discharged cells recharging takes approximately 14 hours. There is no danger of overcharging by leaving the cells on charge for a longer period.

6. Having recharged the cells, disconnect the 2808 from the mains supply and push the Charging Adaptor against the end of the Battery Box to release it.

   Provided cells have been left on charge for 14 hours or more they should power a portable instrument for the time specified in its instruction manual. If not, the cells should be replaced.

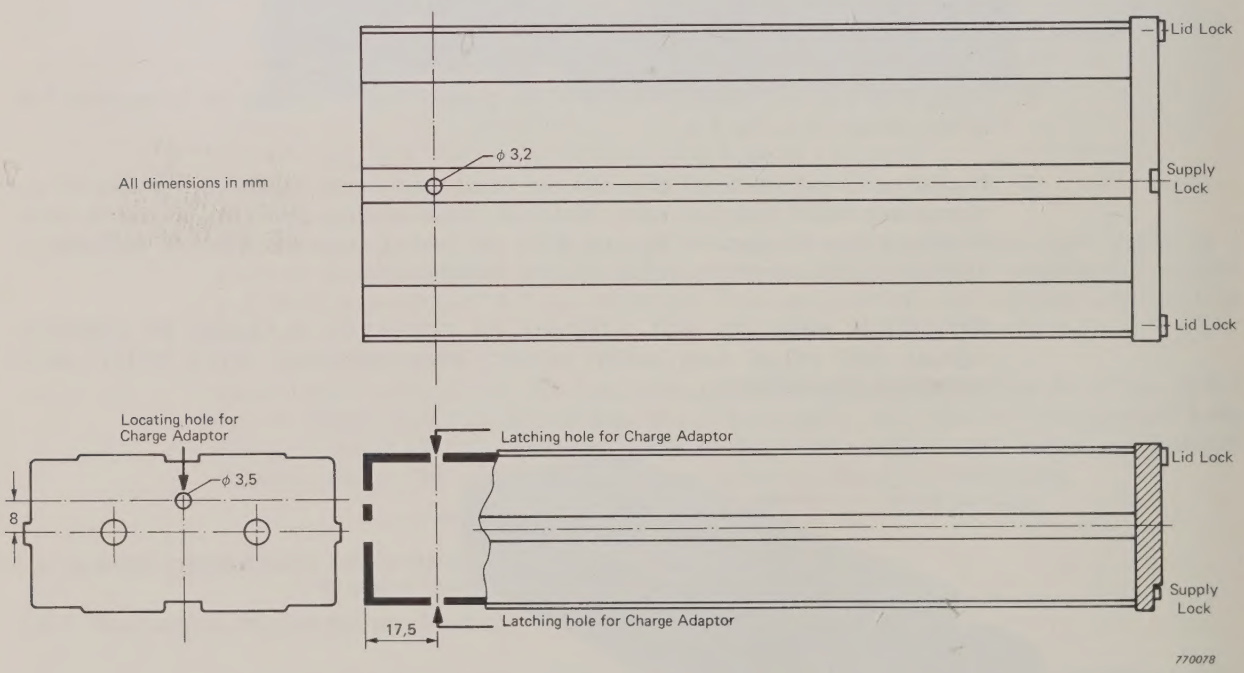


Fig.2.6. Modification of Battery Boxes ZG 0073 and ZG 0106 for use with Charging Adaptor AQ 0157. The hole for the locating pin of the Charging Adaptor must be drilled near the top at the rear end of the box as if the Adaptor is fitted with its poles reversed the cells may explode when charging current is applied

2.4.2. Recharging Nickel Cadmium Cells QB 0008

Aside from B & K instruments that accept plug-in battery packs, the nickel cadmium cells QB 0008 may also be used for powering instruments that normally accept conventional dry cells (size R 20 in IEC publication 86-2).

For recharging the cells the same procedure as given in section 2.4.1 may be used. If less than six cells have to be recharged then dummy cells ZR 0017 should be fitted to make up the correct number of cells contained in the Battery Box. These are available on separate order and aside from ensuring proper contact between the Charging Adaptor and the cells to be recharged, they also limit the maximum charging current for correctly recharging less than six cells.

When loading cells it is important to ensure that they have approximately the same charge. If not the current of partially charged cells may reverse the polarity of discharged cells. For this reason a particular set of cells must always be charged and discharged as a set. Never mix sets of cells that have been used to power different instruments.

2.5.1. BATTERY OPERATION OF CHARGING ADAPTOR AQ 0157

Charging Adaptor AQ 0157 may also be powered from a 12 V car battery, thus enabling plug-in battery packs and cells QB 0008 to be recharged in the field or whilst travelling between measurement sites. To connect the Adaptor a 7 pin DIN socket (B & K no. JJ 0709) may be wired to the battery as shown in Fig.2.7. Connection of the Adaptor without the Battery Box ZG 0146 fitted should be avoided as otherwise its spring loaded pole contacts could short against metal panelling in the car. The maximum current consumption of the Adaptor is 400 mA.

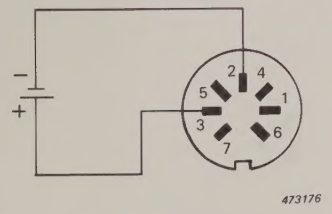
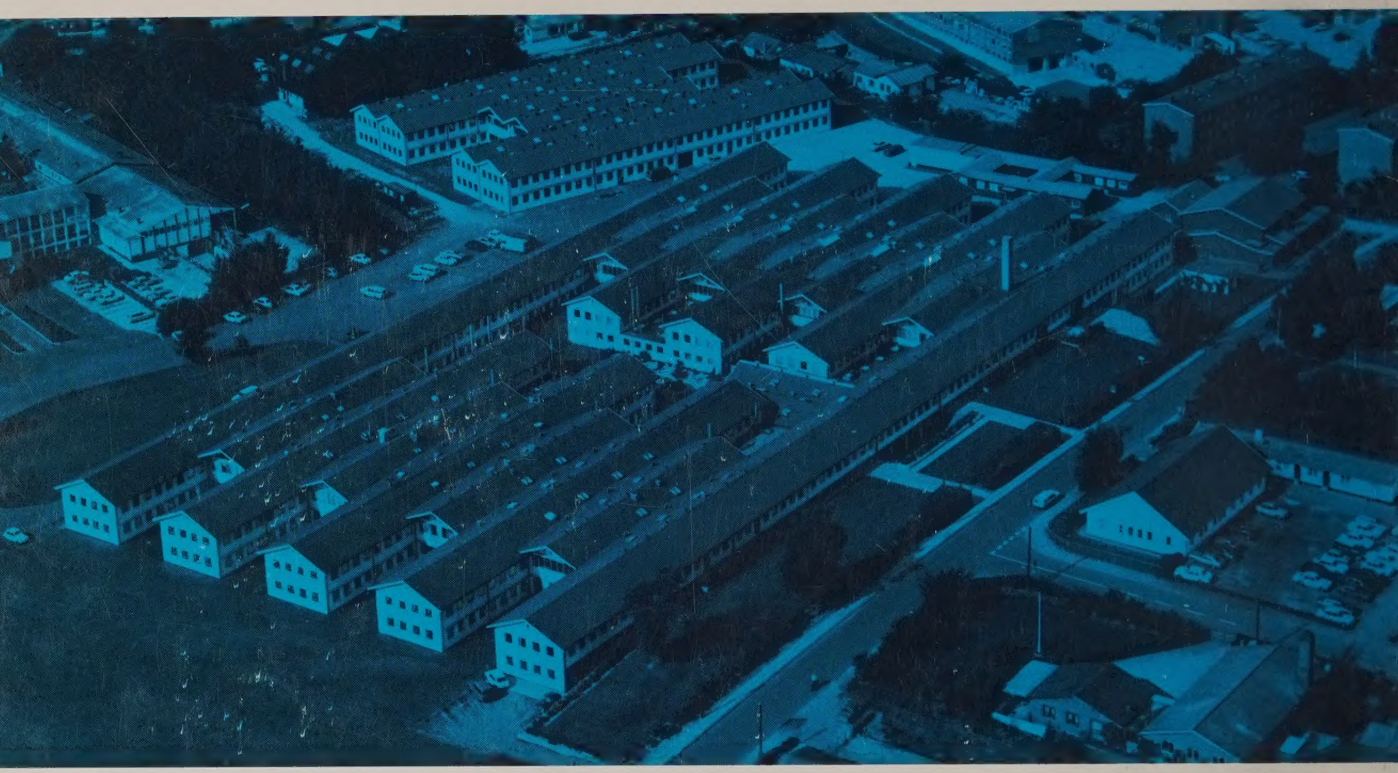


Fig.2.7. Connection of 7 pin DIN socket to 12 volt car battery for powering Charging Adaptor AQ 0157



BRÜEL & KJÆR instruments cover the whole field of sound and vibration measurements. The main groups are:

ACOUSTICAL MEASUREMENTS
Condenser Microphones
Piezoelectric Microphones
Microphone Preamplifiers
Hydrophones
Sound Level Meters
Precision Sound Level Meters
Impulse Sound Level Meters
Noise Dose Meters
Noise Level Analyzers
Standing Wave Apparatus
Calibration Equipment
Reverberation Processors
Sound Sources

ACOUSTICAL RESPONSE TESTING
Sine Generators
Random Noise Generators
Sine-Random Generators
Artificial Voices
Artificial Ears
Artificial Mastoids
Hearing Aid Test Boxes
Audiometer Calibrators
Telephone Measuring Equipment
Audio Reproduction Test Equipment
Tapping Machines
Turntables

VIBRATION MEASUREMENTS
Accelerometers
Force Transducers
Impedance Heads
Accelerometer Preamplifiers
Vibration Meters
Accelerometer Calibrators
Magnetic Transducers
Capacitive Transducers
Complex Modulus Apparatus
Bump Recorders

VIBRATION TESTING
Exciter Controls — Sine
Exciter Controls — Sine — Random
Exciter Equalizers, Random or Shock
Exciters
Power Amplifiers
Programmer Units
Stroboscopes

STRAIN MEASUREMENTS
Strain Gauge Apparatus
Multipoint Selectors

MEASUREMENT AND ANALYSIS
Voltmeters
Phase Meters
Deviation Bridges
Measuring Amplifiers
Band-Pass Filter Sets
Frequency Analyzers
Real Time Analyzers
Heterodyne Filters and Analyzers
Distortion Measuring Equipment
Psophometers
Statistical Distribution Analyzers
Tracking Filters

RECORDING
Level Recorders
Frequency Response Tracers
Tape Recorders
Alphanumeric Printers
Digital Event Recorders

DIGITAL EQUIPMENT
Computers
Tape Punchers
Tape Readers

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